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TITLE: Maximum and minimum thermometer with magnetic indices - includes magnetic scale system for holding indices in position

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ABSTRACTED-PUB-NO: GB 1470971A

BASIC-ABSTRACT:

A max. and min. thermometer having U-shaped capillary tube containing a mercury column extending into each limb of the tube with an index member in each limb, includes magnetic control of the index members. The thermometer consists of a back plate (2) supporting a U-shaped tube (1), the tube having a bulb (13) on the end of one limb filled with a thermometric liquid and an expansion bulb (14) on the end of the other limb. Index members (9), (10) are disposed in the two limbs, with the members made of a magnetic material.

Temp. scales (5), (6) are mounted on a holder (3), the scales forming magnets effective to hold the index members in positions set by movement of the mercury column (11). The thermometer is reset by actuating a push-button (4) which moves the magnet scales backwards away from the tube thereby letting the index members fall onto the ends of the mercury column.

TITLE-TERMS: MAXIMUM MINIMUM THERMOMETER MAGNETIC INDEX MAGNETIC SCALE SYSTEM HOLD INDEX POSITION

DERWENT-CLASS: S03

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(54) IMPROVEMENTS IN OR RELATING TO MAXIMUM AND MINIMUM THERMOMETERS

(71) We, S. BRANNAN & SONS LIMITED, a British Company of Cleator Moor, Cumberland, CA25 5QE, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a maximum and minimum thermometer.

Conventional maximum and minimum thermometers comprise a U-shaped capillary tube provided with a bulb at each end and associated temperature scales. One bulb contains a suitable thermometric liquid the meniscus of which acts against one end of a U-shaped mercury column within the capillary tube. The maximum and minimum temperatures are indicated by indices, one in each limb, which are moved by the mercury column which is itself moved by the thermometric liquid. In order that the indices remain at the maximum and minimum temperatures each index is generally provided with a spring such that, at the maximum or minimum temperature, the position of the index is maintained by friction. The index can be returned to its adjacent surface of the mercury column by means of a hand held magnet.

According to the present invention there is provided a maximum and minimum thermometer comprising a U-shaped capillary tube containing in each limb thereof an index of a magnetic material and further containing a thermometric liquid other than mercury and a mercury thread for moving the indices to indicate maximum and minimum temperatures, the thermometer being provided with a scale or scales which is or are magnets for retaining the indices at the maximum and minimum temperature.

Preferably the thermometer is provided with means for moving the magnetic scale or scales away from the U-shaped tube to permit re-setting of the indices.

The invention will now be described, by

way of example only, with reference to the accompanying drawings in which:

Fig. 1 is a front view of one embodiment of maximum and minimum thermometer according to the invention with retaining bridging members omitted;

Fig. 2 is a section on the line II—II of Fig. 1; and

Fig. 3 is a section on either line III—III of Fig. 1 but showing the retaining bridging member in position.

Referring to Fig. 1 a maximum and minimum thermometer comprises a U-shaped capillary tube 1 mounted onto a back plate 2 by a bottom stop 2A to prevent it moving longitudinally of the back plate 2 and by bridging members (not shown in Fig. 1 but which will be described later) disposed across the back plate 2 at locations III—III, which bridging members prevent the tube 1 from moving in a direction normally to the longitudinal axis of the back plate 2. The back plate 2 at its top is formed with a keyhole slot 2B to permit the thermometer to be hung on a wall or other vertical surface. The back plate 2 accommodates, in a recessed portion thereof, a close fitting depressable scale holder 3 provided with a central push button 4 and mounting two temperature-calibrated scales 5 and 6 which are magnets and which are respectively provided under limbs 7 and 8 of the U-shaped capillary tube 1 over a distance traversable by two indices 9 and 10 each of a magnetic material and provided in limbs 7 and 8 respectively. The indices 9 and 10 are movable by the ends of a U-shaped mercury column or thread 11 acted upon at one of its ends by a thermometric liquid 12, for example alcohol, stored in a terminal bulb 13. The other end of the mercury column or thread 11 is movable along limb 8 of the U-tube 1, said limb being terminated by an expansion bulb 14.

Referring to Figs. 2 and 3, the scale holder 3 is provided with two rearwardly extending longitudinal edge flanges 16 and 17 and a

central longitudinal flange 18 directed towards the rear of back plate 2, the flange 18 being interrupted by a hole 19 accommodating a screw 20 engaging the push button 4. The screw 20 secures the two magnetic scales 5 and 6 between the push button 4 and the scale holder 3 (see Fig. 2), and these scales 5 and 6 are parallel and separate. The scales 5 and 6 are bounded at their outside edges by flanges 22 and 23 and have a common central bounding flange 24. The flanges 22, 23 and 24 frictionally hold the scales 5 and 6 onto the scale holder 3 and the common flange 24 in the region of the push button 4 and hole 19 and screw 20 is cut away to accommodate the push button 4.

Leaf springs 25 and 26 which are part of the back plate 2, are positioned in the area of scales 5 and 6 to urge the latter against the limbs 7, 8.

Two bridging members 27 as hereinbefore mentioned (one at each of the locations III—III) are used for holding the U-shaped capillary tube 1 onto the back plate 2. Each bridging member 27 has two longitudinal edge flanges 27A which fit over the back plate 2 and retain the bridging members 27 on the back plate 2. The bridging members 27 are provided with passages 28 and 29 traversed by the limbs 7 and 8.

In operation the indices 9 and 10 are set to rest one on each end of the mercury thread 11. As is customary, the thermometric liquid 12 expands and contracts with change in temperature such that the mercury thread 11 is caused to move thus altering the positions of the indices 9 and 10. At the maximum and minimum temperature the indices 9 and 10 are no longer supported by the mercury thread 11 but are retained in position by means of the magnetic field produced by the scales 5 and 6. The maximum and minimum temperatures are thus recorded.

In order to reset the instrument the button member 4 is pressed to depress the scale holder 3 into the recessed portion of the back plate 2 against the action of the springs 25, 26 until the longitudinal flanges 16, 17 and 18 contact the back plate 2. The indices 9 and 10 now spaced from the magnetic influences of the scales fall under

gravity to the surface of the mercury thread 11.

It will be appreciated that if the thermometer is not provided with a depressable scale unit then the indices may be reset by use of a hand held magnet.

It will also be appreciated that, for ease of manufacture, many of the structural parts, other than the U-tube and magnetic scales, may be moulded in synthetic plastics material and also that it may be convenient to mark both maximum and minimum temperature scales on one piece of magnetic material.

WHAT WE CLAIM IS:—

1. A maximum and minimum thermometer comprising a U-shaped capillary tube containing in each limb thereof an index of a magnetic material and further containing a thermometric liquid other than mercury and a mercury thread for moving the indices to indicate maximum and minimum temperature, the thermometer being provided with a scale or scales which is or are magnets for retaining the indices at the maximum and minimum temperature.

2. A thermometer as claimed in claim 1 wherein the scale or scales is or are mounted on a holder disposed within a recessed portion of a back plate on which the U-tube is mounted, the holder and back plate being resiliently spaced apart.

3. A thermometer as claimed in claim 2, wherein means is connected to the scale holder to facilitate movement thereof together with the scales against resilient action away from the U-shaped tube and towards the back plate.

4. A thermometer as claimed in claims 2 or 3, wherein the U-tube is maintained in position relative to the back plate by a bottom stop on the latter and a pair of front bridging members.

5. A thermometer as claimed in any one of claims 1 to 4, wherein a scale is provided beneath each limb of the U-tube.

6. A maximum and minimum thermometer, substantially as hereinbefore described with reference to the accompanying drawings.

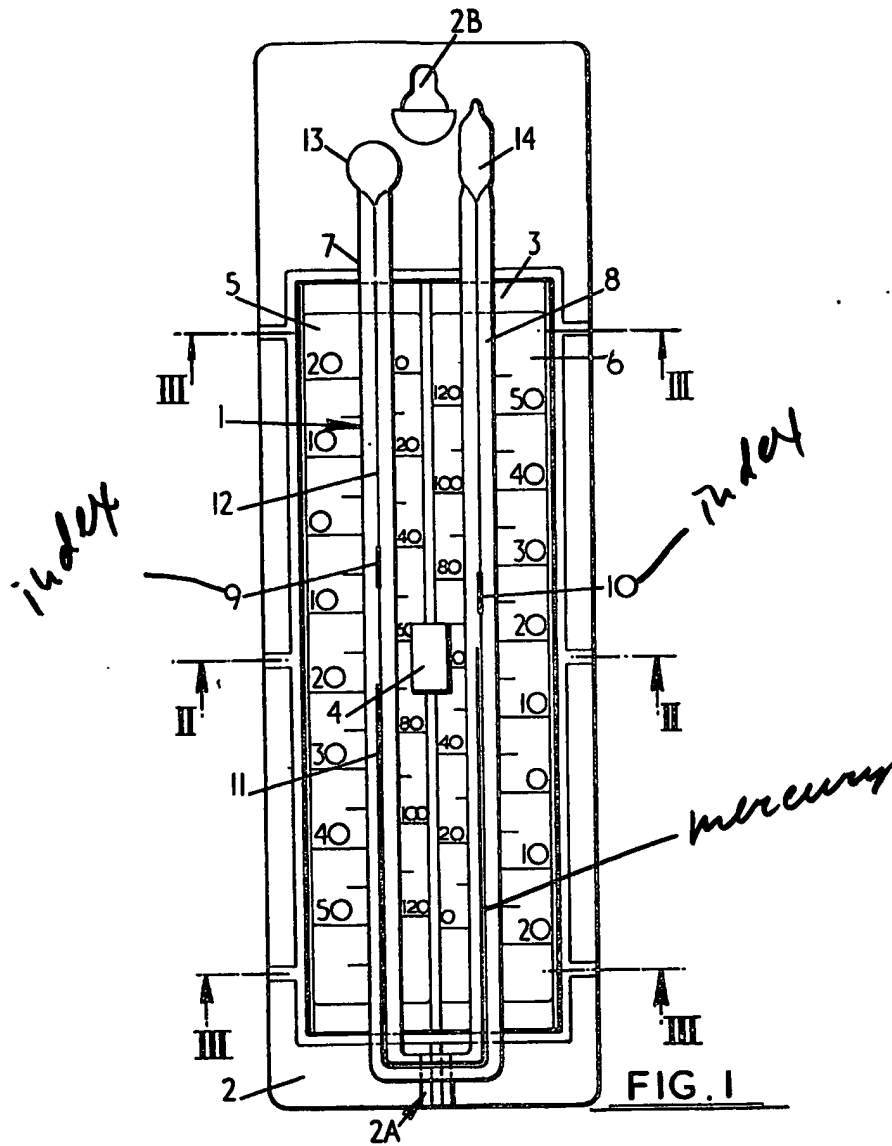
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